

**The Bill Blackwood  
Law Enforcement Management Institute of Texas**

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**A NATIONWIDE MOBILE COMMUNICATIONS SYSTEM**

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**An Administrative Research Paper  
Submitted in Partial Fulfillment  
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## **ABSTRACT**

This research on a nationwide mobile communications system was prepared to enlighten the reader as to where our mobile communications systems are going in the future and further examine why communication at this level is not presently available to the law enforcement community. The basic problem facing public safety now is the fact that most public safety agencies operate on an individually owned and operated radio system. This system is often incompatible with surrounding agencies, thus providing little or no transfer of radio traffic and data between agencies. The methodology used to research this problem came from a variety of sources to include: printed periodicals, professional journals, an author generated survey, and documents provided by national organizations who also researched this dilemma. This author found that while the technical communications systems are already being developed and made available for public use, the cost of such systems are still very high, there is a dilemma as what frequency range will be set aside for this use, and a dilemma as to who will control the systems one in place. This author draws the conclusion that America's Nationwide Mobile Communications systems are still far from being implemented by the Public Safety organizations around this nation.

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## INTRODUCTION

When considering mobile communications, as far back as 1975, most law enforcement agencies realized that communications, mobile and fixed, were becoming an issue that would need addressing for the future of law enforcement to continue to flourish. Radio communications of the past were antiquated by today's standards, leaving huge holes in the spectrum of "complete" police radio coverage. Frequencies often overlapped and left agencies with a garbled quagmire of radio traffic that no one could understand or comprehend.

While it is true that larger agencies had better resources for radio systems and were capable of keeping up with the changing times, no law enforcement radio system was ever successful in bridging the gap between agencies, without providing each other with radios from that agency. Agencies that bordered each other still had the problem of not being able to talk to each other during operations or emergencies. Systems often crashed electronically and left the agency without any means of talking to each other or another agency. Natural disasters caused even bigger problems because in addition to adjoining agencies and not being able to talk to each other in normal operations, these emergencies caused the already overworked radio systems to reach saturation points quickly.

As the 21<sup>st</sup> century came to be, law enforcement found that due to the increased threat of terrorism, an even greater need existed for a communication system that bridged the gaps between agencies and allowed agencies to talk to each other without difficulty. The tragedy of 9-1-1 in New York should have taught law enforcement an extremely important lesson. The three law enforcement agencies that responded to the

World Trade Center Towers had trouble talking to each other on the radio frequencies each agency used normally during that crisis. As a result of that downfall, it is unknown how many lives were lost needlessly. Even cell phones didn't work efficiently enough for emergency crews to utilize during that crisis. This point was mentioned in the Congressional Study on the 9-11 tragedy and was published after the Congressional hearings were concluded and their findings made public.

The purpose of this research paper is to examine why or if this deficiency is still in existence, how it can be corrected and what law enforcement and the communications experts are doing to correct this deficiency. The research is not aimed at any particular agency or department but directed at law enforcement in general and should show what is being done to bring the present modes of communication into the 21st century.

Sources for gathering information for this research include: NCJRS, LEMIT ARP paper # 354, LEMIT ARP PAPER # 203, Texas 9-1-1 Newsletters, APCO International Electronic newsletters, personal interviews and surveys generated by this author. The research is anticipated to prove that a nationwide radio communications system is not only possible, but close to being available to every law enforcement agency in the United States of America. Systems such as the APCO International project 25 and project 16 (which was initiated in 1984) and other companies are becoming more willing to provide technology to bridge the present gaps in communication.

The results of this research should demonstrate that law enforcement would benefit immensely by the incorporation of such systems in to the daily routines of law enforcement operations and provide the necessary communications bridge between

agencies that must deal with crisis. A re-enforced appreciation from the public served by an enhanced communications system that allowed agencies adjoining each other or near each other to communicate during a crisis or even during normal operations would greatly enhance law enforcement's commitment to public safety. Everyone involved would benefit from the rewards of a complete communications system.

## **REVIEW OF LITERATURE**

Current and limited previous research efforts have revealed the undeniable facts that a common mobile radio system that is compatible to every agency needing radio communications is not only desirable, but becoming necessary to function away from a parent agency. This author's agency, a County Sheriff's Office, has frequently been asked to participate in events, either structured or real life, and has had the trouble of communicating with other agencies in the event. The agency uses a 900 MHz radio system and many of our adjoining agencies are still using VHF frequencies, which is not compatible with each other. Therefore, no communication exists via radio systems unless one of the 900 MHz portable radios is provided to the adjoining agency and visa versa. While this is feasible, it is most often times, difficult if not impossible to accomplish. While a nationwide system has not emerged, a statewide mobile radio infra-structure is very possible and at present being tested by the Department of Public Safety and several agencies along the I-35 corridor.

Articles in the Mobile Radio Technology magazine refer to events such as Project 25, a project designed to inter-connect the different mobile radio users, to provide that link in communications that would allow different frequencies and radio groups to talk to each other. Bryant (2000) has described The guide for public officials presented by 13

national law enforcement associations titled *Why can't We talk to Each other? Working Together To Bridge The Communication Gap To Save Lives* stated:

In a time where we can reach across the entire globe to bring news, weather and current event to the public, we still have law enforcement officers, firefighters, and emergency personnel who cannot communicate with each other. The current inability of public safety officials to readily communicate with one another seriously threatens the public's safety and often results in unnecessary loss of lives and property. Recognizing that solutions to this national issue can only be achieved through a partnership between all levels of government, 18 national associations representing State and local elected and appointed officials and public safety officials forming a task force to address this issue. Those 18 organizations include; the Association of Public Safety Communications Officials International, The International Association of Chiefs Of Police, The International Association Of Fire chiefs, the Major County Sheriff's Association, and the National Sheriff's Association. (p. 2)

This published guide attempted to address the complex problems of why agencies cannot talk to one another. The guide identified five key reasons which include: incompatible and aging communications equipment, limited and fragmented funding, a lack of coordination and cooperation, and limited and fragmented radio spectrums.

First, according to the Webster's Dictionary, interoperability refers to the ability to exchange voice and data communications. Simply stated, interoperability is the ability for one agency or talk group to talk to another agency or talk group via radio

communications systems, to exchange voice and data information on demand, in real time, when needed, and with the fewest problems to achieve that goal.

Real life experiences such as the New York City 9-11 tragedy, the Littleton Colorado Columbine high School shootings, the Oklahoma City Bombing, the Ohio River Indiana floods, and the Los Angeles California International Airport shooting at the El Al Ticket counter all refer to the inability for neighboring agencies to communicate with each other to resolve these problems.

Without adequate planning, any agency will not know what they have, where they want to go, or what they will need to get there. Mistakes will be made, time and money will be wasted, and the end result may not be what you intended. Making interoperability a reality requires public safety agencies and surrounding jurisdictions to work together to develop common solutions.

## **METHODOLOGY**

The purpose of this research paper is to examine why public safety officials cannot communicate with each other via radio frequencies and what is being done to resolve this deficiency. This author hypothesizes that while the technical communications systems are already being developed and made available to public use, that the cost of the systems are still very costly, what area of the frequency band is going to be utilized, and who is going to control the systems operation or interoperability seems to be very much in question.

This author will utilize a variety of resources for the study to include: periodicals, research papers submitted by previous participants of LEMIT, newsletters, surveys



generated by this author, and prior studies completed by 13 nationally recognized organizations in the fields of law enforcement, public safety and radio communication. The author generated survey will be developed and distributed to other LEMIT participants in Module I. The size of this survey will be limited to students participating in Module I and will include demographics from a variety of law enforcement agencies that range from small rural sheriff's offices, to large metropolitan agencies for police.

## **FINDINGS**

The response to the survey seemed to be unilateral in the answers provided, in that every returned survey admitted that their systems was not adequate and completely met the needs of their profession, Mobile communications still causes problems with talking to other agencies, and a basic belief that a nationwide system IS possible but not feasible or cost effective.

The limited data received and asked for seemed to reinforce this author's belief that while a nationwide system is possible, it probably will take a number of years yet to develop the instruments and technology to make it affordable to all agencies needing the technology.

The primary reason Public Safety Radio Communications Systems are not interoperable today is because agencies within jurisdictions and neighboring jurisdictions have developed their communications systems independently and want to maintain control of that system. Funding an interoperable radio communications system can be a major stumbling block that has to be overcome, for the system to work for any agency. How much funding will be needed for your particular interoperable system is largely dependant on the method you have chosen to achieve the interoperable radio

system. From channel patching to using a cache of radios, funding for these interim solutions can often be found in existing budgets. Beyond that source of funding; to achieve a more rounded or compatible interoperable radio communications system that would include not only individual internal departments or agencies, but one that would include surrounding jurisdictions and agencies, a different approach to the funding should be considered.

The development of a funding strategy (a plan for how to pay for all components needed during the entire lifecycle of a system) is necessary to achieve the goals set. If an agency only provides funding for a system within their own jurisdiction, they are probably not alone in their line of thinking, as many agencies or jurisdictions do exactly that and nothing further. But that limited line of thought is exactly the line of thinking that keeps jurisdictions from becoming a complete interoperable agency.

How an agency chooses to pay for the interoperability system that is functional and expandable for an agency can come from a variety of sources, such as: lease purchase agreements, capitol appropriations, bond proceeds, revenue enhancements, E-9-1-1 fees, user fees, motor vehicle fees, gaming fees, some transportation funds, and public/private partnerships

A report provided by the Department of Justice and the Department of Treasury November 2001 reported that one of the methods that the experts say will provide this interoperability radio communications system is to use the radio spectrum of 700 MHz, which is controlled by the Federal Communications Commission. Since cell phones normally utilize the 900 MHz frequency ranges and the common garage door opener uses the 40 MHz range, the 700 MHz range seemed to be the frequency range of

choice. However, even the 700 MHz frequency range has issues, in that it is blocked by TV stations in most metropolitan areas, there are Canadian/Mexican border issues, there is a real potential problem for interference from commercial services, and possible equipment and tower requirements due the limited ranges of the frequency itself.

In 1997, Congress committed 24MHz of the radio spectrum in the 700 MHz band to public safety; however, the reallocation is tied to the relocation of analog television channels as part of the television industry move to digital television and upon the availability of equipment that can use that allocation. The 700 MHz band is particularly well suited for wide area (country, large city, state) systems that can accommodate all public safety users who are currently interoperable. Current law allows television to utilize the blocked 700 MHz band until December 31<sup>st</sup>, 2006, or until 85% of households have access to Digital Television signals, whichever is later. Currently only 14.5% of the televisions are capable of receiving Digital television, therefore the ability for public safety to use the 700 MHz radio spectrum is contingent upon how fast the public replaces it's analog televisions with Digital Television capabilities.

Another approach to the interoperability is utilizing hardware that is designed to connect a variety of frequencies for communications. The Lower Colorado River Authority (LCRA) , system providers for a 900 MHz trunking communications system currently utilized all along the Lower Colorado River Authority's span of control has approached interoperability by providing interface hardware on existing radio systems to create that bridge between the variety of radio frequencies that public safety officials routinely use for communications. This solution seems to be more economical for rural agencies that do not have a large tax base to draw from for funding.

## **DISCUSSIONS AND CONCLUSIONS**

The purpose of this research paper was to examine why public safety officials cannot communicate with each other via radio frequencies and what is being done to resolve this deficiency. This author hypothesized that while the technical communications systems are already being developed and made available to public use, that the cost of the systems are still very costly, what area of the frequency band is going to be utilized, and who is going to control the systems operation or interoperability seems to be very much in question.

This author concludes that the cost of providing and making available equipment, technology, hardware, and software for all public safety agencies to communicate with each other at will is still far from reasonable for most agencies to invest in. Further, the radio frequencies designated by the federal government for public safety is still being used by analog television and will not be available for public safety use until 97% of the American public has digital television. The span of control still presents seemingly insurmountable differences of opinion as to who will control the interoperability. The findings of this research strongly support this author's basic belief that a Nationwide mobile Communications System is possible, but not yet practical or affordable by enough public safety agencies to make it work now. This author believes that the information obtained by this research will provide the reader with an insight as where radio systems are headed and why communication at this level is not presently available to the law enforcement community.

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## Appendix a

### RESEARCH SURVEY

1. DO YOU BELIEVE THAT YOUR CURRENT MOBILE COMMUNICATIONS SYSTEM IS ADEQUATE AND MEETS THE NEEDS OF YOUR PROFESSION?  

YES                      NO
  
2. CAN YOUR AGENCY TALK TO ADJOINING OR NEARBY AGENCIES VIA MOBILE RADIOS?  

YES                      NO
  
3. HAS YOUR AGENCY HAD AN EMERGENCY SITUATION ARISE THAT REQUIRED THE USE OF MULTIPLE AGENCY PARTICIPATION AND WHAT FREQUENCY DID THAT OCCUR?  

YES                      NO
  
4. DO YOU BELIEVE THAT A NATIONWIDE MOBILE COMMUNICATIONS SYSTEM IS POSSIBLE?  

YES                      NO
  
5. SIZE OF YOUR AGENCY ( SWORN OFFICERS/DEPUTIES)  

YES                      NO
  
6. TYPE OF AGENCY: CITY COUNTY, STATE FEDERAL

\_\_\_\_\_  
name and Rank (optional)

\_\_\_\_\_  
Date

\_\_\_\_\_  
*Agency*

**Return to Jim Judd**